

Factoring Sums and Differences of Powers

Warm-up: Factor $x^4 - 1$ over the set of polynomials with the indicated coefficients.

1. Real coefficients

2. Complex coefficients

Example 1: Find the four fourth roots of 16.

Sums and Differences of Cubes Theorem:

Example 2: Factor $x^3 - 64y^{12}$ over the set of polynomials with rational coefficients.

Sums and Differences of Odd Powers Theorem:

Example 3: Factor $t^7 - w^7$ over the set of polynomials with rational coefficients.

Example 4: Factor $m^6 + n^6$ over the set of polynomials with rational coefficients.

Example 5: Factor $x^{10} - y^{10}$ completely over the set of polynomials with rational coefficients.

Homework:

**"WE DON'T KNOW WHO WE ARE UNTIL WE SEE WHAT WE CAN DO."
- MARTHA GRIMES**